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The zone of proximal development in Vygotsky's analysis of learning and instruction

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What kind of instruction is optimal for a particular child? Without doubt, this question is immediately comprehensible to any committed teacher in virtually any country in the world, and most of them are likely to want concrete answers to the question, not only as a theoretical puzzle, but in relation to their immediate practices. If one were to look to scientific psychology and educational research for advice in relation to this practical problem, what would the answer(s) look like?

This simple question raises several profound problems. Normative and political issues about the goals of instruction and the resources available for realizing these goals must be resolved. A theory of learning is needed that can explain how intellectual capabilities are developed. If instruction is not viewed as an end in itself, then a theory about the relationship between specific subject-matter instruction and its consequences for psychological development is also needed. This last problem was the main tension against which Vygotsky developed his well-known concept of *zone of proximal development*, where the zone was meant to focus attention on the relation between instruction and development, while being relevant to many of these other problems.

Vygotsky's concept of zone of proximal development is more precise and elaborated than its common reception or interpretation. The main purpose of this chapter is to provide a comprehensive introduction to and interpretation of this concept, along with comments about predominant contemporary interpretations. The chapter concludes with some perspectives and implications derived from the interpretation presented here.

Locating the Zone of Proximal Development

The term 'zone of proximal development' is probably one of the most widely- and well-known ideas associated with Vygotsky's scientific production. The term now appears in most developmental and educational psychology textbooks, as well as some general psychology textbooks. Within educational research, the concept is now used widely (or referred to) in studies about teaching and learning in many subject-matter areas, including reading, writing, mathematics, science, second-language learning (e.g., Dunn & Lantolf, 1998; Lantolf & Pavlenko, 1995), moral education (e.g., Tappan, 1998), and violin teaching (Gholson, 1998); with diverse kinds of pupils, including so-called disadvantaged, learning disabled, retarded, and gifted students; with preschool children (e.g., Smith, 1993) and adults (e.g., Kilgore, 1999); with information technologies and computer-mediated communication (e.g., Hung, 2001); with children's use of libraries (McKechnie, 1997); with discussions about teacher training (e.g., Jones, Rua, & Carter, 1998; Torres, 1996), and nursing education (e.g., Spouse, 1998). The concept has also been picked up and used in serious and substantive ways in other academic disciplines and professional areas, including nursing (e.g., Holaday, LaMontagne, & Marciel, 1994), psychoanalysis (e.g., Wilson & Weinstein, 1996), psychotherapy (e.g., Leiman & Stiles, 2001), and occupational therapy (e.g., Exner, 1990; Lyons, 1984).

Although the term was already available in the 1962 translation of *Thought and Language*, it was primarily the appearance of Chapter 6 in *Mind in Society* (1978) that marked a transition to

sustained attention to the concept by an English-reading audience. At this moment in history, the concept — at least in a somewhat simplified form — is reasonably well-known among educationally-oriented researchers. Therefore, most readers of this chapter will have already encountered some or all of the standard phrases often used to explicate or define the concept, especially the definition from the aforementioned chapter: “*the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers*” (Vygotsky, 1978, p. 86, emphasis in the original) or “what the child is able to do in collaboration today he will be able to do independently tomorrow” (Vygotsky, 1934/1987, p. 211, see also, 1934/1998b, p. 202).

Popularity has its price, however. Wertsch (1984) suggested that if this theoretical construct was not elaborated further, then there was a risk that “it will be used loosely and indiscriminately, thereby becoming so amorphous that it loses all explanatory power” (p. 7). Mercer and Fisher (1992) believe that “there is a danger that the term is used as little more than a fashionable alternative to Piagetian terminology or the concept of IQ for describing individual differences in attainment or potential” (p. 342). Palinscar (1998) suggests that in the context of research about the negotiated nature of teaching and learning it is “probably one of the most used and least understood constructs to appear in contemporary educational literature” (p. 370).

Just what does that famous phrase from page 86 mean? One rarely encounters other sources cited or discussed in relation to zone of proximal development beyond this 1978 text, with an occasional supplement from *Thinking and Speech* (1987). Is this the only or main definition? Is current knowledge about the zone of proximal development mostly reflective of attempts to interpret these textual fragments, possibly supplemented with a little general knowledge of Vygotsky’s approach? Unless additional texts are considered, is there any reason to believe that one scholar has a better interpretation of those words than another?

Common Conceptions of the Zone of Proximal Development

The common conception of the zone of proximal development presupposes an interaction between a more competent person and a less competent person on a task, such that the less competent person becomes independently proficient at what was initially a jointly-accomplished task. Within this general conception, three main aspects are often highlighted or emphasized (though not necessarily all three by a single researcher). For the sake of discussion, these three aspects together represent an ‘ideal type’ that will be called the ‘common interpretation’ of the zone of proximal development. For ease of reference, the three aspects will be named *generality assumption* (i.e., applicable to learning all kinds of subject matter), *assistance assumption* (learning is dependent on interventions by a more competent other), and *potential assumption* (property of learner, which enables best and easiest learning).

The first aspect focuses on the idea that a person is able to perform a certain number of tasks alone, while in collaboration, it is possible to perform a greater number of tasks. The “range of tasks” performed in collaboration is sometimes presented as the definition of zone of proximal development (e.g., Berk, 1997, p. 248), but this is surely mistaken. Even the classic definition refers to levels of development, not tasks. At best, the number (or kinds) of tasks must be taken as indicators to be interpreted in relation to a level of development. A related issue is what kinds of tasks involve a zone of proximal development. It is often assumed that the zone of proximal

development is meant to be applied to any kind of learning task. ‘For any domain of skill, a ZPD can be created’ (Tharp & Gallimore, 1998, p. 96) or in an ‘expanded’ conception formulated by Wells (1999), zone of proximal development applies to ‘any situation in which, while participating in an activity, individuals are in the process of developing mastery of a practice or understanding a topic’ (p. 333).

The second aspect emphasizes how an adult/teacher/more competent person should interact with a child. Sometimes this aspect is presented as the defining characteristic. “Arguably, the notion of the zone of proximal development is little more meaningful than that of a learning situation presented to a child, where adults and/or more advanced children directly or indirectly have a positive influence on the child” (Gillen, 2000, pp. 193-194).

The third aspect focuses on “properties of the learner”, including notions of a learner’s potential and/or readiness to learn. This aspect often seems to inspire the idea or expectation that it will be possible to greatly accelerate or facilitate a child’s learning, if the zone can be identified properly. Here are two illustrations from recent textbook discussions: “It is within this zone that a person’s potential for new learning is strongest” (Fabes & Martin, 2001, p. 42) or “Vygotsky’s phrase for the individual’s current potential for further intellectual development, a capacity not ordinarily measured by conventional intelligence tests.” (LeFrancois, 2001, p. 587). Sometimes this aspect is interpreted to mean that teaching in the zone of proximal development should result in the easiest or most effortless form of learning for the child (e.g., “a student’s zone of proximal development is the range of book readability levels that will challenge a student without causing frustration or loss of motivation” 1998 abstract in ERIC database).

Critique of the Common Conception

The common conception of the zone of proximal development supports or inspires a vision of educational perfection, in which the insightful (or lucky) teacher is able to help a child master, effortlessly and joyfully, whatever subject matter is on the day’s program. With this kind of conception, a reader is likely to expect that a chapter about the zone of proximal development and instruction will explain (a) how to identify a child’s zone of proximal development for each learning task, (b) how to teach in a way that will be sure to engage the zone of proximal development, which (c) in a smooth and joyful way will significantly accelerate learning. There are, however, some problems for this perfect vision.

Generality assumption. If Vygotsky’s intention was to use the concept for all kinds of learning, then why not name it the “zone of proximal learning?” Why does the term “development” appear in the concept? The use of the term ‘development’ is not coincidental. In several texts, Vygotsky analyzed how the relationship between learning and development was formulated within existing psychological traditions (1934/1987, pp. 194-201; 1935b, see Van der Veer & Valsiner, 1991, pp. 329-331 for a summary; 1935d, 1982b), concluding that there is a unity but not an identity between learning and inner developmental processes (Vygotsky, 1982d, p. 123). Vygotsky (1934/1987) distinguishes instruction aimed “toward [the child’s] full development from instruction in specialized, technical skills such as typing or riding a bicycle” (p. 212). In short, zone of proximal development is not concerned with the development of skill of any particular task, but must be related to development.

Assistance assumption. Because a competent teacher is important for learning, the zone of proximal development notion is often used to focus on the importance of more competent assistance. However, when Vygotsky first introduces the zone of proximal development in *Thinking and Speech*, he considers it a well-known fact that “with collaboration, direction, or some kind of help the child is always able to do more and solve more difficult tasks that [sic] he can independently” (Vygotsky, 1934/1987, p. 209). More important, in his view, is to explain why this happens. In other words, it is not the competence per se of the more knowledgeable person that is important, rather it is to understand the meaning of that assistance in relation to a child’s learning and development.

Potential assumption. Vygotsky never assumed that learning related to the zone of proximal development is always enjoyable. Vygotsky (1967, p. 16) gives an example: a child running a race may not be having pleasure, especially after losing, yet still this action can still be part of the zone of proximal development. Similarly, as will be developed below, the potential is not a property of the child — as these formulations are sometimes interpreted — but simply an indication of the presence of certain maturing functions, which enables a situation that gives a potential for meaningful, interventive action.

The preceding analysis is meant to raise doubts about common interpretations of Vygotsky’s concept of zone of proximal development, and motivate the need to consider more concretely what Vygotsky meant by the concept. There are at least eight published texts in which Vygotsky used the expression “zone of proximal development” at least once (see Figure 1 for a list of these texts, together with some of the published translations). Most of these texts have only brief comments about the concept, while more extensive discussion is found in Chap. 6 of *Thinking and Speech* and the chapter “Problem of Age”. In other words, there is not an extensive corpus of material from which Vygotsky’s true meaning, or official definition or interpretation can be found (but see the bibliography in Rieber, 1999; it is likely that some of the unpublished, currently unavailable texts from 1933 and 1934 also discussed this concept). One could read most of the material listed in Figure 1 in a few hours, especially because several of the texts have considerable overlap in their contents. From that point of view, it should be easy to become an “expert” in Vygotsky’s concept, and with no need for an interpretative discussion.

It will be more productive, however, to focus on the conceptual problems that Vygotsky was trying to address when the zone of proximal development was introduced. The main interest then is to present an interpretation that more fully integrates with other theoretical concepts and arguments that Vygotsky was developing in relation to the zone of proximal development. Given that Vygotsky was the source of the arguments that are identified today as ‘zone of proximal development’, it seems worthwhile to allow his version to be presented from within his own theoretical perspective, rather than filtering or refracting it through the lens of contemporary concerns and positions (Cazden, 1996, has a similar argument in relation to Vygotskian-inspired research on writing). This more comprehensive interpretation of Vygotsky’s research program is not given here simply as a historical curiosity; the theoretical model deserves further investigation, criticism, and elaboration. As a first step, however, we should make sure to have a reasonable understanding of how the theoretical analysis is constructed and what it is trying to achieve.

‘Zone of Proximal Development’ in Vygotsky’s Theoretical Perspective

The zone of proximal development was introduced as a part of a general analysis about child development. It is not a main or central concept in Vygotsky's (1934/1998b) theory of child development. Rather its role is to point to an important place and moment in the process of child development. To understand this role, one must appreciate the theoretical perspective in which it appeared. That is, we need to understand what Vygotsky meant by 'development' in general, if we are going to understand what he meant by 'zone of proximal development' in particular. In this way, the reader can develop a generative understanding of the theoretical approach, which will be more valuable than a dictionary definition of the concept.

Vygotsky's Theory of Child Development

Vygotsky formulated several requirements or criteria that should be satisfied by a model of child development. First, the model must be explanatory, rather than descriptive. More specifically, the model should be organized by substantial principles that can explain development "as a single process of self-development" (Vygotsky, 1934/1998b, p. 189). Second, the model should consider the *whole child*, as an integral person. Third, childhood should be divided into periods, where each period is characterized in a principled and unified way. That is, the same abstract explanatory principles should be used to characterize each period (hence the unity), but the concrete manifestation of the abstract relations must be discovered and characterized for the particular content of each age period.

To meet these requirements, Vygotsky proposed that each period of childhood should be characterized abstractly by a psychological structure, a set of integral relations among psychological functions (e.g., perception, voluntary memory, speech, thinking). This structure should reflect the whole child (i.e., as a person engaged in structured social relations with others) — not only as a description of the qualities of the child, but also as a description of the child's relationship to her environment. From a psychological point of view, this whole is described as an integrated structure of relationships among developed and developing higher psychological functions acquired through material interaction. This psychological description of a child focuses on interrelationships between functions, rather than considering individual psychological functions in isolation. For example, two-year-old children tend to be directed more by reactions to what they can immediately perceive than by their willful formation of an imagined possibility (i.e., a thought). In this case, the functions of perception, thought, and will stand in a particular relation to each other, such that perception is dominating in relation to will and thought (Vygotsky, 1934/1982d, p. 104). The psychological structure refers to the structural relationships among a set of psychological functions.

The focus on the whole precludes a methodological approach that considers specific functions without considering their relation to the whole. In this way, Vygotsky can realize his goal of "understanding development as a process that is characterized by a unity of material and mental aspects, a unity of the social and the personal during the child's ascent up the stages of development" (p. 190). These two unities (material/mental and social/personal) are alternative ways of expressing the same idea, and they are both unities because the child's psychological structure (i.e., the mental, the personal) is always reflecting a relation to the social and material.

Vygotsky proposed to describe the development of children, from infancy to adolescence, as a series of relatively long stable periods (one to four years), punctuated by shorter periods of crisis (see Mahn, this volume, for a comprehensive account of Vygotsky's model of age periods; also Davydov, 1988, pp. 63-87). To explain the causal-dynamic of this development, one has to give an

account for how and why there is a qualitative change in the psychological structure that is characteristic for each age period. The starting point for Vygotsky's explanation is the child's specific, but comprehensive, relationship to its environment, designated as the *social situation of development*. "The social situation of development represents the initial moment for all dynamic changes that occur in development during the given period," therefore, to study the dynamics of any age, one must first explain the social situation of development (Vygotsky, 1934/1998b, p. 198).

Each age period has a characteristic central *new-formation* in relation to which psychological functions develop (Vygotsky, 1934/1998b, p. 197). This new-formation is organized in the social situation of development by a basic contradiction between the child's current capabilities (as manifested in the actually-developed psychological functions), the child's needs and desires, and the demands and possibilities of the environment. In trying to overcome this contradiction (so that it can realize its activity), the child engages in different concrete tasks and specific interactions, which can result in the formation of new functions or the enrichment of existing functions. The central new-formation produced for a given age period is a consequence of the child's interactions in the social situation of development with relevant psychological functions that are not yet mature. (For a concrete analysis for the infant age period, cf. Vygotsky, 1934/1998a, especially pp. 215-216; for a useful and related elaboration of Vygotsky's conception of development, cf. Schneuwly, 1994, pp. 282-284.)

Many (even most) of the child's specific actions in daily life do not need to be oriented to confronting this contradiction (sometimes called the predominant activity). However, the functions needed for a transition to a new age period (i.e., a structural change in the organization of functions) are formed and elaborated (in relation to the central new-formation) in those situations in which the child engages specifically in actions relevant to this contradiction. Each period has a leading activity that is the main source of development within a period (Vygotsky, 1967, pp. 15-16). The notion of "leading activity" is a way to identify the particular relations in the social situation of development that are likely to contribute to the development of the functions that lead to the structural reorganization of a child's psychological functions. (This general idea has been subsequently connected to the theory of activity and developed in more detail, e.g., El'konin, 1999.) The activity itself is not developing the child; rather, in order to realize the leading activity, the child engages in actions that serve to develop the psychological functions needed for that activity. The new-formation is a product, not a prerequisite, of an age period (Vygotsky, 1934/1998b, p. 198).

It is important to recognize that these age periods are understood as historically and materially constructed — historically because the functions are constructed through the history of human practices; materially because the functions are developed as a consequence of tasks and interactions with others. The social situation of development provides a way to characterize the interaction between historically-constructed forms of practice with the child's own interests and actions enabled by the current age period of the child. Rather than being a passive recipient of an objective environment, the child is selective about what is perceived and interesting. This relation changes with each specific age period, reflecting the structure of the psychological functions for that age. (See Lampert Shepel, 1995, pp. 429-431, for a related view.)

Changes in historical relations would incline a researcher to predict changes in psychological functions (see Bodrova and Leong, this volume, for a discussion of this question in relation to early childhood). It is important to recognize that these periods are not reflecting a biological necessity

(because of genetic or other organic sources), even though the development of higher psychological functions (e.g., perception, voluntary memory, speech, thinking) are dependent on these natural conditions. When Vygotsky writes about ‘age’, then it is understood as reflecting a psychological category and not only a temporal characteristic. Thus, in the statement, “the actual level of development is determined by that age, that stage or phase within a given age that the child is experiencing at that time” (Vygotsky, 1934/1998b, p. 199), one can understand ‘within a given age’ to refer to the period of development. Similarly, none of the psychological functions are “pure” in the sense of a biologically-given module or faculty. Rather they were formed, both historically in the phylogenetic development of human societies, and individually in the ontogenetic development of persons within these societies.

The Zone of Proximal Development in Vygotsky’s Theory of Child Development

We can now use this model of child development, as Vygotsky did, to introduce the idea of zone of proximal development. The zone of proximal development is used for two different purposes in the analysis of psychological development (i.e., transition from one age period to another). One purpose is to identify the kinds of maturing psychological functions (and the social interactions associated with them) needed for transition from one age period to the next. The other is to identify the child’s current state in relation to developing these functions needed for that transition. Let us consider each use in turn.

For each age period, there are a group of psychological functions that are maturing in relation to the central new-formation, and which will lead to the restructuring of the existing functions to the formation of a new structure. This new-formation results in a transition to the next age period. For clarity of reference, I will designate this tripartite constellation of ‘present age’, ‘maturing functions’, and ‘next age’ as the *objective* zone of proximal development. This zone is ‘objective’ in the sense that it does not refer to any individual child, but reflects the psychological functions that need to be formed during a given age period, in order for the next age period to be formed.

The ‘objective’ zone is not defined a priori, but reflects the structural relationships that are historically-constructed and objectively constituted in the historical period in which the child lives. One can say that the zone for a given age period is normative, in that it reflects the institutionalized demands and expectations that developed historically in a particular societal tradition of practice. For example, school-age children are expected to develop capabilities to reason with academic (i.e., scientific) concepts. Individuals who do not develop this capability can be said to have a different intellectual structure than most school-age children. Reasoning with concepts is a specific manifestation of the new-formations for this age, which Vygotsky suggests are *conscious awareness and volition*.¹

All the major new mental functions that actively participate in school instruction are associated with the important new formations of this age, that is, with conscious awareness and volition. These are the features that distinguish all the higher mental functions that develop during this period. (Vygotsky, 1934/1987, p. 213)

With different objective conditions (i.e., social situation of development), such as the lives of children working in English factories during the 19th century (see Marx 1867/1990, Chap. 10, sect. 3-6), then one would need to characterize a different objective zone of proximal development for a given age period.

For a given objective zone of proximal development, it is possible to (attempt to) assess the current state of an individual child's development (in relation to the objective zone). According to Vygotsky's theory, the maturing functions are the source of changes in the internal structure of a given age period. Assessment procedures should be aimed at identifying the current status of these maturing functions. Because these functions are inadequate for independent performance, it is necessary to identify them through dynamic, interactive procedures that provide indications for estimating the extent of their development (see Lidz and Gindis, this volume, for an extensive discussion of such procedures). This estimate can be understood in relative terms — that is, the current state of the maturing functions relative to the structural changes that characterize the next age period. One can refer to the extent to which a child's currently maturing functions are realizing the structure of the next age period as the *subjective* zone of proximal development. It is called 'subjective' to indicate that one is speaking about the development of an individual person in relation to the objective, historically-formed period of next development.

In sum, the main features of the analysis of zone of proximal development are: (a) whole child, (b) internal structure (i.e., relationships between psychological functions), (c) development as a qualitative change in the structural relationships, (d) brought about from the child's actions in the social situation of development (reflecting what the child perceives and is interested in), where (e) each age period has a leading activity/contradiction that organizes the child's actions (within which subjective interests are operating) and which contributes to the development of the new functions. Zone of proximal development is a way to refer to both the functions that are developing ontogenetically for a given age period (objective), and a child's current state of development in relation to the functions that ideally need to be realized (subjective). In this respect, the zone of proximal development is both a theoretical and an empirical discovery.

Identifying (and Explaining) the Subjective Zone of Proximal Development: The Role of Imitation

The main problem addressed here is “how does one identify or assess an individual child's zone of proximal development”? Several issues must be considered: (a) why does one want to assess the zone of proximal development, (b) why the zone of proximal development exists, (c) the role of imitation and collaboration, and (d) the “size” of a subjective zone. These diverse aspects are unified by a general interest to understand the dynamics of development in relation to a psychology directed at practice. (The objective zone exists through the social situation of development.)

Why Do We Want to Assess the Zone of Proximal Development?

As a first step for understanding how Vygotsky formulated the subjective zone of proximal development, it is important and necessary to understand why one would want to make such an assessment. Remember that Vygotsky's interest is to develop a theoretical basis for appropriate pedagogical interventions, including principles for possible instructional grouping of children, and identification of specific interventions for individual children. Interventions must be based on diagnostic procedures grounded in an explanatory understanding of a child's current state of development. In this view, it is not acceptable to have only (correlated) indicators or symptoms of psychological development; one must use a theoretical understanding of the processes by which a person develops. “A true diagnosis must provide an explanation, prediction, and scientific basis for practical prescription” (Vygotsky, 1934/1998b, p. 205). A solution to the diagnostic problem is

identical with having an explanatory theory of psychological development. From this perspective, one can understand why Vygotsky (1934/1998b) links age level, practice, and diagnostics:

The problem of age level is not only central to all of child psychology, but is also the key to all the problems of practice. This problem is directly and closely connected with the diagnostics of age-related development of the child. (p. 199)

In sum, if we understand the causal-dynamics of child development, then we should be able to develop procedures to assess a person's current state of development in a way that provides insight into what that person needs to develop. Vygotsky proposes that the zone of proximal development as a diagnostic principle "allows us to penetrate into the internal causal-dynamic and genetic connections that determine the process itself of mental development" (p. 203). To realize the ideal that Vygotsky proposes, one needs a theoretical explanation of why a subjective zone of proximal development exists and how it operates if we are going to assess an individual child's zone of proximal development (i.e., the subjective zone of proximal development).

Why Does the (Subjective) Zone of Proximal Development Exist?

To understand Vygotsky's explanation for the existence of the zone of proximal development, we have to consider his technical concept of imitation, around which his analysis is constructed. A person's ability to imitate, as conceived by Vygotsky, is the basis for a subjective zone of proximal development. (The objective zone exists through the social situation of development.)

Imitation, as used here, is not a mindless copying of actions (1931/1997a, p. 95; 1934/1998b, p. 202). Rather Vygotsky wants to break from a copying view, to give a new meaning to *imitation* — reflecting a new theoretical position — in which imitation presupposes some understanding of the structural relations in a problem that is being solved (1934/1987, p. 210).

A child is not able to imitate anything (1934/1998b, p. 201; 1934/1987, p. 209). "[I]mitation is possible only to the extent and in those forms in which it is accompanied by understanding" (Vygotsky, 1931/1997a, p. 96). "It is well established that the child can imitate only what lies within the zone of his intellectual potential" (Vygotsky, 1934/1987, p. 209). Imitation refers to "all kinds of activity of a certain type carried out by the child ... in cooperation with adults or with another child" (1934/1998b, p. 202), and includes "everything that the child cannot do independently, but which he can be taught or which he can do with direction or cooperation or with the help of leading questions" (1934/1998b, p. 202).

The crucial assumption is that imitation is possible because (a) maturing psychological functions are still insufficient to support independent performance, but (b) have developed sufficiently so that (c) a person can understand how to use collaborative actions (e.g., leading questions, demonstrations) from another. The presence of these maturing functions is why the zone of proximal development exists. Alternatively, one can say that the zone of proximal development is defined as referring to those intellectual actions and mental functions that a child is able to use in interaction, where independent performance is inadequate.

Further Clarification of Imitation

Vygotsky probably believed that there was some likelihood of the term *imitation* being misunderstood. He recognized that he was trying to give a new meaning to a term that had been used previously in other theoretical perspectives. For example, when he first introduced this idea in *History of the Development of Higher Mental Functions* (1931/1997a), he signals his intended reformulation (“which we might call by the generally accepted word *imitation*”) and then immediately tries to avoid misunderstanding, “it may seem that in speaking of imitation ... we are returning to the prejudices of which we have just spoken” (p. 95). Similarly, he sometimes referred to imitation “understood in a broad sense” (Vygotsky, 1934/1987, p. 210) or “as defined above” (1934/1998b, p. 202).

He wanted to avoid these misunderstandings, because he considered imitation (as he was trying to define it) as “one of the basic paths of cultural development of the child” (1931/1997a, p. 95). The term “imitation” in Vygotsky’s texts should be read with an awareness that a special technical meaning is intended. Whether Vygotsky’s concept of imitation is elaborated adequately is a different question and deserves further examination. For present purposes, let us try to understand what was intended with the concept.

We see here that Vygotsky used the term *imitation* to refer to situations in which a child is able to engage in interaction with more competent others around specific tasks that the child would otherwise not be able to perform alone, because of the presence of maturing psychological functions. “[T]he child can enter into imitation through intellectual actions more or less far beyond what he is capable of in independent mental and purposeful actions or intellectual operations” (1934/1998b, p. 201). For example:

If I am not able to play chess, I will not be able to play a match even if a chess master shows me how. If I know arithmetic, but run into difficulty with the solution of a complex problem, a demonstration will immediately lead to my own resolution of the problem. On the other hand, if I do not know higher mathematics, a demonstration of the resolution of a differential equation will not move my own thought in that direction by a single step. To imitate, there must be some possibility of moving from what I can do to what I cannot. (Vygotsky, 1934/1987, p. 209)

Together with this attempt to shift the meaning of ‘imitation’, one can see a core idea of a subjective zone of proximal development in Vygotsky’s thinking, formulated at least two years before its first recorded mention: “summarizing the new position of psychology in this area, we might say: *the circle of available imitation coincides with the circle of the actual development possibilities of the animal* (Vygotsky, 1931/1997a, p. 95). This critical assumption, for which Vygotsky (1934/1998b) claims research support, is subsequently formulated in a stronger form: there is “a strict genetic pattern between what a child is able to imitate and his mental development” (p. 202).

Using Imitation to Assess the Zone of Proximal Development

We can now consider how the concept of imitation provides a theoretical justification for how to assess a child’s (subjective) zone of proximal development. “The area of immature, but maturing processes makes up the child’s zone of proximal development” (Vygotsky, 1934/1998b, p. 202).

For a given child, these maturing functions are more or less developed, but unable to support independent performance. Independent performance cannot provide evidence of what maturing functions are present. If the child already had developed adequate mental functions, then independent performance would be possible. In an interaction situation (collaboration), the child can only imitate that for which the maturing functions are present. If the child had no capability to imitate, then this would be taken as an indication that relevant maturing mental functions were not present. In other words, the child is only able to take advantage of that assistance for which the child can understand the significance. So, one determines “what the child is capable of in intellectual imitation if we understand this term as defined above” (1934/1998b, p. 202).

Successful (assisted) performance can be used as an indicator of the state of a maturing psychological function.

Roughly speaking, by testing the limits of possible imitation, we test the limits of the intellect of the given animal. ... If we want to learn how much a given intellect has matured for one function or another, we can test this by means of imitation. (Vygotsky, (1931/1997a, p. 96)

In brief, we ask the child to solve problems that are beyond his mental age [as measured by independent performance] with some kind of cooperation and determine how far the potential for intellectual cooperation can be stretched for the given child and how far it goes beyond his mental age. (Vygotsky, 1934/1998b, p. 202)

Purpose of Collaboration in Assessing and Characterizing the Size of the Zone of Proximal Development

Interaction or collaboration with a child is used to assess a child’s (subjective) zone of proximal development, because it provides an opportunity for imitation, which is the way for identifying maturing psychological functions that are still inadequate for independent performance. This can be seen implicitly in the following quote:

by applying the principle of cooperation for establishing the zone of proximal development, we make it possible to study directly what determines most precisely the mental maturation that must be realized in the proximal and subsequent periods of his stage of development. (Vygotsky, 1934/1998b, p. 203)

Vygotsky often uses the term *collaboration* in his discussion about assessing the zone of proximal development. The term ‘collaboration’ should not be understood as a joint, coordinated effort to move forward, where the more expert partner is always providing support at the moments where maturing functions are inadequate. Rather it appears that this term is being used to refer to any situation in which a child is being offered some interaction with another person in relation to a problem to be solved. The main focus for collaborative interventions is to find evidence for maturing psychological functions, with the assumption that the child could only take advantage of these interventions because the maturing function supports an ability to understand the significance of the support being offered.

Vygotsky does not seem to have any systematic principles, methods or techniques that should guide how collaboration should be conducted by a person who is assessing a zone of proximal development — if one judges from his discussions in the texts being discussed here. Consider these

examples of interventions for assessing the (subjective) zone of proximal development of a child. “We assist each child through demonstration, leading questions, and by introducing elements of the task’s solution” (Vygotsky, 1934/1987, p. 209). Here is the most comprehensive list I have been able to find in which Vygotsky (1934/1998b) proposes that after giving a problem to a child

We show the child how such a problem must be solved and watch to see if he can do the problem by imitating the demonstration. Or we begin to solve the problem and ask the child to finish it. Or we propose that the child solve the problem that is beyond his mental age by cooperating with another, more developed child or, finally, we explain to the child the principle of solving the problem, ask leading questions, analyze the problem for him, etc. (p. 202)

I do not see any principled sequence in these types of interventions, and there is no discussion here (or elsewhere that I could see) about how to interpret responses to different interventions in relation to the zone of proximal development.

Interpreting the Results of Collaboration

Although Vygotsky does not give a detailed account of procedures to assess the zone of proximal development, he does indicate how one might (roughly) interpret the results of making collaborative problem solving with a child, focusing on a (presumably) hypothetical example of two children whose mental age is measured (by standard intelligence testing procedures) to be eight years (Vygotsky, 1934/1998b, pp. 202-203; 1934/1987, p. 209). After engaging in assisted problem solving (of unspecified problems) with the children, it is determined that with assistance one child solves problems that correspond to the standards for a 12-year old, while the other child solves problems that correspond to the standard for a 9-year old. “With respect to maturing processes, one went four times further than the other” (1934/1998b, p. 203).

Of greater interest is the use Vygotsky makes of these diagnostics in instructional experiments. If one assumes that it is possible, in an approximate fashion, to use a collaboration procedure and interpretation as described in the previous paragraph, then it should be possible to identify children who have “larger” and “smaller” zones of proximal development. It is important to note that this “size” refers to the extent to which a child can take advantage of collaboration to realize performance beyond what is specified by independent performance and relative to age norms. There is no reason to believe that this “size” is a fixed property of a child that remains constant across age periods.

With this procedure in hand, it was possible for Vygotsky to undertake experiments that explored the consequences of using the results of this procedure as a principle for grouping children for instructional purposes. In one article, which as far as I know is neither translated nor readily available, Vygotsky (1935a) describes a set of experiments in which children are tested and identified to have a high or low IQ as well as a large or small zone (as determined by the kind of procedure described in the previous paragraph). Subsequent school success is determined, and it appears that the size of the zone of proximal development was more predictive than IQ. That is, children with a larger zone of proximal development (i.e., more maturing functions are currently available) had comparable intellectual development, regardless of IQ. Similarly, children with a smaller zone of proximal development had a comparable intellectual development, regardless of the initially measured IQ. In other words, the zone of proximal development gave a better indication

for predicting/understanding future intellectual development than a measure of independent performance, where the explanation is that the greater number of maturing functions gives a child better opportunities to benefit from school instruction. A detailed summary of this article is found in van der Veer and Valsiner (1991, pp. 336-341).

Handling Some Theoretical Inelegancies

As a tentative summary, it appears that Vygotsky formulated a general theoretical logic for assessing the (subjective) zone of proximal development, but only had an opportunity to work out specific procedures for making collaboration and interpreting the results in a rough or approximate manner. In presenting Vygotsky's concept of imitation and how it is used to investigate the (subjective) zone of proximal development, I have tried to highlight this general theoretical logic, in particular, the ideas that the zone should be defined on the basis of an explanatory account of the nature of development and that assessment should be directed to these processes. Future work needs to consider whether to develop (or reject) this logic.

This distinction — between the theoretical logic and the specific proposals for realizing this logic — provides a useful way for handling some of the conceptual problems that arise in trying to frame the idea of zone of proximal development in terms of maturing functions, new-formations and age periods, while relating it to the idea of mental age and independent performance, which is probably predicated on a different developmental theory.

In his published discussions, Vygotsky seems to accept uncritically that independent performance is, in fact, measuring fully developed psychological functions. Similarly, he refers to mental age, but how would this relate to the idea of an age period? What is the relationship between mental ages and the new-formations needed for transition to the next age period? The notion of imitation is tied to a Gestalt concept of structural insight — should that be dropped, revised, or supplemented? Much contemporary research has been done now on interactions in joint-problem solving between an adult and a child. Does this work require revision and elaboration of Vygotsky's rather undifferentiated notion of collaboration? There are many more questions of this kind that could be raised. They are not likely to be solved semantically by refining definitions. More important is to focus on the framing of the problem (i.e., the theoretical structure of the general argument being formulated), which in this case is to have an explanation of development and a procedure for diagnosis motivated directly by that theory of development and not by symptoms of behavior. Future work should be focused to refine and elaborate that theoretical program (e.g., assessments of mental development should be directly related to the specific psychological functions that are developing; need to identify psychological functions needed for supporting the transition to the next age period) drawing on whatever additional understanding we have about processes of development and learning.

Perspectives and Implications (in lieu of a summary)

— in most general terms, the idea of zone of proximal development is meant to direct attention to the idea that instruction/teaching (*obuchenie*) should be focused on maturing psychological functions, rather than already existing functions, that are relevant for the general intellectual development to the next age period.

- the zone describes a structural relation, both in terms of the number, extent, and relations among maturing functions (subjective) and in relation to the functions needed for the next age period (objective). That is, the objective zone (i.e., what developments are going to lead to the next development) is the same for all the children, but an individual child's subjective position in relation to this objective zone, is different (1934/1987, p. 209; 1934/1986, p. 187; 1935/1982b, pp. 116-119; for a summary of 1935a, see Van der Veer and Valsiner, pp. 338-339).
- the content and meaning of the zone will change depending on which age period is being considered. The general principle for understanding the dynamics of the structural change is the same, but one needs to examine the social situation for development, the existing psychological structure, and the next structure being formed in order to appropriately characterize the objective zone of proximal development for a given age period.
- the focus on the learning of academic or school concepts in relation to the zone of proximal development appears because this development is relevant in relation to school age, and not because the zone of proximal development always involves development of academic concepts. Other age periods will have other foci.
- in relation to the school age, the theoretical function of Vygotsky's zone of proximal development research can be understood as a search for identifying a principled way for conceptualizing schooling in relation to the whole child and not just the child's performance on a single task (see Hedegaard, 1990, for a useful example).
- the zone of proximal development is not simply a way to refer to development through assistance by a more competent other. This assistance is meaningful only in relation to maturing functions needed for transition to the next age period.
- the zone is never located solely in the child, not even the subjective zone. The subjective zone is always an evaluation of a child's capabilities in relation to the theoretical model of the age period.

Implications in Relation to Contemporary Interpretations

- some researchers have characterized Vygotsky's concept as "metaphorical" and/or "heuristic" (e.g., Daniels, 2001, p. 56; Lloyd & Fernyhough, 1999, p. 18; Kovalainen, Kumpulainen, & Vasama, 2001, p. 18; Valsiner, 1998, p. 68; Wells, 1999, p. 314), or rhetorical, descriptive, and not intended for systematic theoretical development (Valsiner, 1998, p. 69; Valsiner & van der Veer, 1993, p. 43). There does not seem to be any support for such assertions.
- some researchers argue that the zone of proximal development is created in interaction between child and adult (e.g., Davydov, 1998, p. 29; Mercer and Fisher, 1992, p. 342; Sternberg & Grigorenko, 2002, pp. 37-38). These arguments deserve more analysis. According to the analysis presented here, the zone of proximal development refers to the maturing functions that are relevant to the next age period and that enable performance in collaborative situations that could not be achieved independently. These functions are not created in interaction; rather interaction provides conditions for identifying their existence and the extent to which they have developed.

Many issues remain to be discussed:

- the historical context and methodological basis on which these ideas were developed
- relations with Vygotsky's (1931/1997a) theory of the development of psychological functions
- relations with the scaffolding literature (see Stone, 1998 for a good discussion)
- problems with Vygotsky's theoretical formulations
- problems with many contemporary interpretations of the zone of proximal development
- implications for theories of instruction and instructional design
- implications for classroom teaching and diverse pupils

Concluding Comment

One attraction of the idea of zone of proximal development in relation to educational practices is that it provides a distinctive perspective for conceptualizing the relation between human learning and development — a perspective which also has some fundamental differences from many of the currently predominant views about this relation. Despite slender textual material available from Vygotsky about the zone of proximal development, interpretations of the idea has been sufficient to stimulate a lot of research and reflection to clarify and elaborate the basic idea. This has yielded a diversity of interpretations and variations, which is likely to continue in the coming decades, given the somewhat underspecified nature of the original formulation and the variety of practical situations in which the idea is being used. These variations and elaborations, together with their critical evaluation, are a necessary part of the scientific process needed to refine the zone of proximal development as a concept for understanding and developing educational practices.

There is no reason to defend the infallibility or sufficiency of Vygotsky's arguments and achievements with the zone of proximal development concept. However, (a) Vygotsky was trying to raise a set of issues that have not been confronted adequately in the contemporary literature that refers to this concept, (b) many of the "resolutions" or "new developments" that diverse authors have proposed seem to be a dilution of these general theoretical issues, rather than a clarification or deepening, and (c) many of the arguments, criticisms, and concerns that have been raised are directly wrong or not pointed toward Vygotsky's theoretical perspective at all. Persons who want to use the zone of proximal development concept should, as a minimum, try to understand the particular theoretical and conceptual problems Vygotsky was trying to address when he formulated this concept.

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Now that more of Vygotsky's texts are readily available, there is no excuse to continue to use limited or distorted interpretations of the concept. It seems more appropriate to use the term *zone of proximal development* to refer to the phenomenon that Vygotsky was writing about, and find other terms (e.g., assisted instruction, scaffolding) to refer to practices like teaching a specific subject-matter concept, skill, and so forth. This is not to deny the meaningfulness of other investigations (e.g., joint problem solving, dynamic assessment of intellectual capabilities), only to indicate that there is no additional scientific value to refer to this as zone of proximal development, unless one concurrently has a developmental theory to which these assessments can be related. It is precisely on this point that one can see, by way of contrast, how most work that refers to zone of proximal development does not have a such a developmental theory, even implicitly. This aspect deserves to be investigated more intensively.

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Endnotes

¹The specific new functions for a given age (in this case, conscious awareness and volition) may be open for debate and analysis. For present purposes, we are concentrating on the conceptual form of Vygotsky's argument, and not whether the particular substantive claim in this case can be justified.